



US009409183B2

(12) **United States Patent**
Kean et al.

(10) **Patent No.:** **US 9,409,183 B2**
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **PUMP AND SUBMERSIBLE SOLIDS
PROCESSING ARRANGEMENT**

E02F 3/8841; E02F 3/9225; F16J 15/50;
F16J 15/54

See application file for complete search history.

(71) Applicant: **Weir Minerals Australia, Ltd.,**
Artarmon NSW (AU)

(56) **References Cited**

(72) Inventors: **Jamie W. Kean**, Macungie, PA (US);
Gary Saylor, Sugarloaf, PA (US); **David**
P. Nevin, Breinigsville, PA (US);
Michael Hill, Hazleton, PA (US)

U.S. PATENT DOCUMENTS

805,965 A * 11/1905 Jones E02F 3/9231
37/325

3,444,818 A 5/1969 Sutton

(Continued)

(73) Assignee: **Weir Minerals Australia, Ltd. (AU)**

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 659 days.

FOREIGN PATENT DOCUMENTS

CA 2288230 A1 4/2001
GB 2298679 A 9/1996

(Continued)

(21) Appl. No.: **13/720,813**

(22) Filed: **Dec. 19, 2012**

OTHER PUBLICATIONS

Machine translation for JP 2003-074487, "Submerged Pump".*

(65) **Prior Publication Data**

US 2014/0027546 A1 Jan. 30, 2014

(Continued)

Related U.S. Application Data

(60) Provisional application No. 61/677,359, filed on Jul.
30, 2012, provisional application No. 61/703,014,
filed on Sep. 19, 2012.

Primary Examiner — Alexander P Taousakis

Assistant Examiner — Leonel Vasquez

(74) *Attorney, Agent, or Firm* — Morriss O'Bryant
Compagni

(51) **Int. Cl.**

B02C 23/00 (2006.01)

B02C 23/02 (2006.01)

(Continued)

(52) **U.S. Cl.**

CPC **B02C 23/00** (2013.01); **B02C 23/02**
(2013.01); **B02C 23/36** (2013.01); **F04D 7/045**
(2013.01); **F04D 13/086** (2013.01)

(58) **Field of Classification Search**

CPC B02C 23/00; B02C 23/02; B02C 23/36;
B02C 18/0092; F04D 13/086; F04D 7/045;
F04D 1/02; F04D 29/2288; F04D 7/04;
F04D 29/04; F04D 29/10; F04B 53/00;

(57)

ABSTRACT

A pump and submersible solids processing arrangement includes a pump, having a suction inlet and discharge, and a submersible solids processing arrangement positioned in fluid communication with the suction inlet of the pump and being structured to macerate larger solids and matter that is entrained in a fluid to thereby reduce the size of the solids prior to entry of the fluid and solids into the inlet of the pump, the arrangement further including macerating members the speed and arrangement of which are selectively determinable or adjustable, and the arrangement further comprising an agitator arrangement for directing solids into the submersible solids processing arrangement.

20 Claims, 16 Drawing Sheets

